

# **LOCK-IN SUPPORT SYSTEM FOR GRILL**

## **BACKGROUND OF THE INVENTION**

### **Field of the Invention**

[0001] The present invention relates generally to a grill having a grill bottom, grates for supporting coals and food, and a cover. The invention relates more specifically to a support mechanism for a grill, the mechanism detachably attaching to the bottom portion or kettle of the grill without fasteners and having projecting pieces that go through holes in the kettle, some of the projecting pieces supporting the grate for the coals and other projecting pieces supporting the grate for the food.

### **Description of Prior Art**

[0002] Grills to be used outdoors for cooking a variety of food items have long been known. There are grills, for example, which are smokeless, such as the one disclosed in U.S. Patent 6,263,784 B1, and grills which have two or more food supporting sections, such as the one disclosed in U.S. Patent 5,983,882. Further, the grill disclosed in Schlosser et al., U.S. Patent 4,535,749, is designed to be permanently assembled and installed in a backyard or on a large patio. Schlosser et al. discloses a kettle grill whose bottom is generally semi-hemispherical; the legs are attached to the bottom using screws or bolts fastened with nuts. These bolts extend through the legs and the grill, so that the rack which holds the charcoal can be placed on or supported by these bolts. Thus this grill, and other similar grills, contain many parts, including multiple screws or bolts with nuts or wing nuts, and often require special equipment for assembly. Also, the legs of this grill attach on the bottom portion of the bottom half of the grill; the legs are bolted to the grill both on the sides and in the center of the grill bottom. Grills having multiple fasteners are difficult to assemble, suffer from failure to be assembled due to lost

parts, and are sometimes incorrectly assembled due to using the fasteners incorrectly or not adequately tightening the fasteners.

[0003] There is a need for a grill having a support system which contains a minimal number of parts, is sturdy and is easy to assemble and disassemble without the use of special tools or equipment. The present invention fills the need for such a grill in a unique manner.

#### Summary of the Invention

[0004] An object of this invention is to provide a system which supports a grill and is easy to assemble and disassemble without the use of special tools or equipment.

[0005] A further object of this invention is to provide a system which supports a grill and also supports the grates or racks for holding food and fuel within the grill.

[0006] A further object of this invention is to provide a system which supports a grill and is attached to the grill without using screws or other fasteners.

[0007] Another object of this invention is to provide a system which supports a grill and contains a minimal number of parts.

[0008] Another object of this invention is to provide a system which supports a grill which includes toggle clips for locking a cover onto the grill.

[0009] Yet another object of this invention is to provide a system which supports a grill which is inexpensive to manufacture.

[0010] These and other objects will become apparent from the following description of a preferred embodiment taken together with the accompanying drawings.

[0011] The foregoing objects are achieved according to the preferred embodiment of the invention by a support system which is detachably attached to the grill without fasteners and which has projecting pieces that go through holes in the bottom portion or kettle of the grill,

some projecting pieces supporting the grate for the coals and other projecting pieces supporting the grate for the food.

#### Brief Description of the Drawings

[0012] The invention may take physical form in certain parts and arrangement of parts, a preferred embodiment of which will be described in detail in the specification and illustrated in the accompanying drawings which form a part hereof, and wherein:

[0013] FIG. 1 is a perspective view of a grill with the support mechanism;

[0014] FIG. 2 is a side view of the grill bottom kettle of Figure 1 without the support mechanism;

[0015] FIG. 2a is a side view of an alternate embodiment of the grill bottom kettle;

[0016] FIG. 2b is a bottom view of an alternate embodiment of the grill bottom kettle;

[0017] FIG. 3 is a top view of the grill bottom kettle and support mechanism of Figure 1;

[0018] FIG. 3a is a side view of the grill cover of Figure 1;

[0019] FIG. 4 is a section through the direction line 4-4 in Figure 1;

[0020] FIG. 5 is a bottom view of the grill and support mechanism of Figure 1;

[0021] FIG. 6 is a side view of a leg piece of the support mechanism;

[0022] FIG. 7 is a top view of the lower portion of the leg piece of the support mechanism;

[0023] FIG. 8 is a perspective view of the upper portion of the leg piece of the support mechanism; and

[0024] FIG. 9 is a detailed view of the toggle lock in the locked position.

#### Detailed Description of the Preferred Embodiment

[0025] Referring to the drawings, which are used for illustration and not to limit the invention therewith, a system or support mechanism 2 for supporting a grill having a grill bottom, kettle or

bowl **4**, a grate or rack **6** for supporting charcoal briquettes or other barbeque fuel such as gas, or gas burners with sear trays, a grate or rack **8** for supporting food to be cooked, and a cover **10**, is shown. The grill cover **10** is generally semi-hemispherical in shape, being flat on its top **12** and having generally smooth sides curving outwardly and terminating in an inverted L-shaped edge **14** (when viewed in cross section as shown in FIG. 4) which extends around the entire circumference of the cover. Each side of the L of the L-shaped edge **14** can be about 1/4 inch wide. Vent openings **15** and a rotatable vent cover **16** (shown in phantom) and a handle **17**, which can be attached near the flat top **12** of the cover using a pin or screw (not shown), would be included as part of the grill cover.

[0026] The grill bottom **4** is generally kettle- or bowl-shaped; its sides are generally smooth but include two indentations **18**, **24** (forming a ridge or shelf on the inside of the grill bottom) where the side curves or bends inwardly forming a 1/4 inch bump or shelf on the inside of the bowl. The center indentations **18** can be in the middle of the grill bottom **4**, about half way between the bottom, closed end, of the bowl **20** and the top, open end **22**; the center indentation **18** can be about 1/4 inch deep and can extend the entire circumference of the bowl. The top indentation **24** can also extend the entire circumference of the bowl and can also be about 1/4 inch deep, but it is located within an inch of the top, open end **22** of the bowl. On its open end, the bowl terminates in a curved or circular (in cross section) border or rim **26**, forming a narrow horizontally projecting edge which extends over the top edge **22** of the grill bottom **4**. The rim **26** cooperates with L-shaped edge **14** of cover **10** to close the grill and prevent rain water and the like from leaking in, and reduce the amount of smoke and odors leaving the grill. Indentation **18**, indentation **24**, and rim **26** are all generally parallel, offset and coaxial, and concentric.

[0027] Below the rim, there are three generally rectangular upper openings **28** in the top ridge **24**

of the grill bottom for receiving supporting apparatus, such as a metal shelf, metal plate or flat metal piece, (extending from a leg piece as described below) for supporting the food rack **8**. Further below the rim, and slightly below the center indentation **18**, there are three generally rectangular, co-planar lower openings **30** in the grill for receiving supporting apparatus, such as a metal shelf, metal plate or flat metal piece (extending from a leg piece also as described below), for supporting the charcoal or fuel rack **6**. The upper openings **28** are equidistantly spaced in the same plane along the circumference of the bowl so that rack **8** will remain flat when supported in grill bottom **4**. Similarly, the lower openings **30** are equidistantly spaced in the same plane along the circumference of the bowl for supporting rack **6** in a flat position, each lower opening being directly below an upper opening. Kettle vent openings **31** are provided for air to ventilate across the barbeque fuel and can include a bent out pair of slits **31** through kettle **4**, which could have protrusions such as bent out parts of the kettle beneath the respective slits.

[0028] In an alternative embodiment, shown in FIGs. 2a and 2b, the grill bottom **104** has generally sloping sides and a flat bottom **120**, and is configured in the form of a truncated cone. On its open end, the grill bottom **104** terminates in a curved or circular border or rim **126**, forming a narrow horizontally projecting edge which extends from the top edge **122** of the grill bottom **104**. The rim **126** cooperates with L-shaped edge **14** of cover **10** to close the grill and reduce the exhaustion of smoke and odors. Vent holes **133** can be made in the bottom **120**, and holders or tabs **135** can also be on the bottom **120**. The holders **135** can secure a detachable ashtray **136** (shown partially secured) which receives the ashes from the fuel when the grill is in use.

[0029] Between 1/4 inch and 3/4 inch below the rim **126** of the grill bottom **104**, there are three generally rectangular upper openings **128** for receiving supporting apparatus, such as a metal

shelf, metal plate or flat metal piece, (formed from part of a leg piece as described below) for supporting the food rack **8**. Further below the rim, and below the center of the grill bottom, there are three generally rectangular, co-planar lower openings **130** in the grill bottom for receiving supporting apparatus, such as a metal shelf, metal plate or flat metal piece (formed from a leg piece, also as described below), for supporting the fuel rack **6**. The upper openings **128** are equidistantly spaced in the same plane along the circumference of the bowl so that rack **8** will remain flat when supported in grill bottom **104**. Similarly, the lower openings **130** are equidistantly spaced in the same plane along the circumference of the bowl for supporting rack **6** in a flat position, each lower opening being directly below an upper opening. Kettle vent openings **131**, which can have protrusions extending from beneath the openings, are provided in the grill bottom **104** for air to ventilate across the barbeque fuel. Openings **131** can include a bent out pair of slits through the grill bottom.

[0030] In either embodiment, the support mechanism **2** consists of three identical leg pieces **32**, shown most clearly in FIG. 6. Each leg piece has a top end **34** from which is stamped or otherwise bent an upper generally inverted L-shaped upper bent portion or upper tab **36** which is transverse to the body of each leg piece **32**, and which can be received by one of the upper openings **28** in grill bottom **4** and, below the upper tab **36**, is a lower bent portion or lower tab **38** which is generally parallel to upper tab **36**, and which can be received by one of the lower openings **30**. In the preferred embodiment, the leg pieces **32** are metal, and preferably aluminum or other lightweight metal alloy, although leg pieces could also be made from stainless steel, galvanized steel, or other sheet metal products which could be coated for heat and weather resistance. Upper tab **36** is advantageously bent from leg piece **32** so that the upper tab **36** extends to form a first horizontal portion **40**, followed by a vertical portion **42**, from which

extends a second horizontal portion **44** from the leg piece, the second horizontal extension or portion **44** extending toward the center of the grill bottom bowl **4**. Portion **40** provides a shoulder for abutting the upper surface defining opening **28**, and extension **44** forms a shelf for receiving the rim of grate **8**. The food rack **8** can be a circular grate or rack with the circular rim as shown in FIG. 3, and which sits on extension **44** so that the leg pieces support the food rack **8**. In a preferred embodiment, the lower tab **38** extends generally horizontally from the leg piece toward the center of the grill bottom bowl **4**, and forms a shelf on which the rim of the rack **6** for holding charcoal or other barbeque fuel can be placed in a manner similar to that of the food rack **8**.

[0031] Leg pieces **32** each have connected to each other in sequence an upper portion **46**, a middle portion **48**, and a bottom portion **49**. The upper portion **46**, which constitutes about one third of leg piece **32** (and about one half of its outer generally vertical segment), is shown curved to match the contour of the grill bottom kettle **4**. For use with an alternative embodiment of the bottom kettle, shown in FIG. 2a, the upper portion **46** can be straight. When installed, the top end **34** of the leg piece **32** extends through openings **28**, **128** under the rolled metal forming the rim **26**, **126** of the grill bottom **4**, **104**. The middle portion **48** of the leg piece **32**, also constituting about one third of leg piece **32**, is generally straight and extends away from the upper portion **46** at an angle of between 90 and 150 degrees and extends away from the grill bottom **20** at an angle of about 30 degrees from vertical (measured clockwise from the vertical extending beneath the intersection of portions **46** and **48**). The leg piece **32** will contact the support surface **s** in a plane vertically under the rim **26** of the grill bottom kettle **4** for increased stability of the support system. The bottom third portion **49** of leg piece **32** forms an inner radial portion which extends upward at an internal angle of between 60 and 90 degrees from the lower

portion of middle piece 48 (measured clockwise from the middle piece 48) and extends generally up and under the grill bottom 20. This bottom third portion 49 contains three sections, the first section forming a foot 50 which is almost horizontal, the second section 52 extending upward from the first portion and being generally parallel to the middle portion 48, and the third section 54 extending generally horizontally inward underneath the grill bottom, and this third section culminates in a loose or free end 56. The loose end 56 of the leg piece 32 contains an opening 58 for receiving fastening apparatus. The openings 58 for all loose ends 56 of leg pieces can be joined together by placing a screw 60 with wing nut 62 or other fastening apparatus through all of the openings simultaneously, fastening the leg pieces 32 to each other to complete the support mechanism 2.

[0032] In a preferred embodiment, each leg piece 32 also includes a toggle lock 64 between the upper tab 36 and lower tab 38 for detachably attaching the support mechanism 2 and grill bottom kettle 4 to the grill cover 10. The toggle lock 64 can be fastened by means such as bolting, welding, riveting or soldering, to the upper portion 46 of the leg piece 32. As shown in FIG. 9, the toggle lock 64 is depicted in its locked condition. It is comprised of a base piece 66, a locking arm 68 pivotally mounted on an axle 69 extending through a pair of outwardly extending brackets of base piece 66, and a locking wire 70 pivotally attached to arm 68. Toggle lock 64 is a locking device which is stable in both the locked and unlocked positions, so that, when in the locked position, it is not biased toward the locked position or vice versa. Use of the toggle lock 64 is as follows. One places the grill cover 10 onto the grill bottom kettle 4 so that the rim of the grill bottom kettle 4 is engaged with the L-shaped edge 14 of the grill cover 10. Next, locking arm 68 is pivoted toward or above the horizontal position so that the locking wire 70 can move freely, and can be pivoted onto the L-shaped edge 14 of the grill cover. Finally, the locking arm



**68** is forced downward over its center position so that it pressed against or abuts the base piece **66** of the toggle lock, to bias locking wire against the upper surface of rim **14** of cover **10** for locking or attaching the grill cover **10** to the grill bottom kettle **4**. To unlock the toggle lock **64**, one simply pivots the locking arm **68** towards or over its center position to the horizontal position, releasing the locking wire **70** which then can be rotated from the L-shaped edge **14** of the grill cover **10**. Once all of toggle locks **64** are moved from their locked to their open conditions, the cover can be removed.

[0033] The three leg pieces **32** are evenly spaced around the perimeter of the grill bottom **4**, **104** for stability. The upper openings **28**, **128** in the grill bottom **4**, **104** are also evenly spaced around the perimeter of the grill bottom, preferably about one inch below the rim **26**, **126**. The lower openings **30**, **130** in the grill bottom are evenly spaced around the perimeter of the grill bottom, preferably between two and four inches below the rim **26**, **126**.

[0034] Assembly of the current invention is easy. First, one screws the handle **16** onto the grill cover **10** (although this step could be done at any time). Optionally, one can attach a vent cover to the grill cover over vent openings **15** by means of a connector inserted through an artifice between vent openings **15** as shown in FIG. 1. Next, one places the grill bottom **4** with its rim **26**, **126** on a flat surface and its lower surface **20**, **120** facing up. In an embodiment with an ashtray **136**, the ashtray is attached to the grill bottom **120** by sliding the ashtray into the holders **135**. In any embodiment, to install the leg pieces **32**, one inserts the top end **34** of each leg piece **32**, in turn, under the exterior lip or rim **26**, **126** of the grill bottom **4**, **104**. Next, for each leg piece **32**, upper tab **36** is placed through an upper opening **28**, **128** and lower tab **38** is placed through the lower opening **30**, **130** beneath the corresponding upper opening **28** in the grill bottom **4**, **104**. Once all of the leg pieces **32** are in place, the fastening apparatus, such as a screw

60, is inserted through the leg openings 58 in each of the loose ends 56 of the three legs 32. The apparatus is fastened together by, for example, screwing a wing nut 62 onto the screw 60 (which preferably has a wing handle fixed thereto for rotating screw 60). Next, one turns over the grill bottom 4 and attached leg pieces 32 so that the leg pieces are on the desired support surface s, such as a table or patio, and the charcoal rack 6 is put on the lower tabs 38 in the grill bottom 4 and the cooking or food rack 8 is put on upper tabs 36 in the grill bottom 4. Finally, the cover 10 is placed on the grill bottom and the cover 10 is locked onto the grill bottom 4 with the three toggle locks 64.

[0035] Grill cover 10 and grill bottom 4 can be made of any stiff sheet metal which is strong enough to receive random blows, be resistant to heat from hot fuel and not subject to corrosion from water or from heating food. The metal could be aluminum, galvanized steel or stainless steel. Metals subject to corrosion could be coated with a heat and chip resistant paint which are commonly used in the market.

[0036] The invention has been described with particular emphasis on the preferred embodiments. It should be appreciated that these embodiments are described for purposes of illustration only, and that numerous alterations and modifications may be practiced by those skilled in the art without departing from the spirit and scope of the invention. It is intended that all such modifications and alterations be included insofar as they come within the scope of the invention or the equivalents thereof.